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L2: Entry 1 of 1

File: USPT

Jul 3, 2001

US-PAT-NO: [6255466](#)

DOCUMENT-IDENTIFIER: US [6255466](#) B1

**\*\* See image for [Certificate of Correction](#) \*\***

TITLE: Purified plant expansion proteins and DNA encoding same

DATE-ISSUED: July 3, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cosgrove; Daniel J.	State College	PA		
McQueen-Mason; Simon	York			GB
Guiltinan; Mark	State College	PA		
Shcherban; Tatyana	State College	PA		
Shi; Jun	State College	PA		

US-CL-CURRENT: [536/23.1](#); [435/252.3](#), [435/320.1](#), [435/69.1](#), [530/350](#), [536/23.2](#),  
[536/23.5](#), [536/23.6](#)

CLAIMS:

What is claimed is:

1. An isolated polynucleotide comprising a nucleotide sequence of SEQ ID NO: 1, and which encodes a protein having expansin activity.
2. An isolated polynucleotide comprising a DNA sequence encoding a polypeptide selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6 and SEQ ID NO: 7.
3. An isolated polynucleotide having 90% sequence similarity to SEQ ID NO: 1, and which encodes a protein having expansin activity.

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L3: Entry 3 of 3

File: USPT

Sep 28, 1999

US-PAT-NO: 5959082

DOCUMENT-IDENTIFIER: US 5959082 A

TITLE: Proteins catalyzing the extension of plant cell walls

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cosgrove; Daniel J.	State College	PA		
McQueen-Mason; Simon	York			GB
Guiltinan; Mark	State College	PA		
Shcherban; Tatyana	State College	PA		
Shi; Jun	State College	PA		

US-CL-CURRENT: 530/370; 530/324, 530/372, 530/375, 530/376, 530/377, 530/378,  
530/379, 530/412, 530/417, 530/418, 530/419

CLAIMS:

What is claimed is:

1. A catalytic composition comprising an acidic medium and a salt-soluble polypeptide having a molecular weight of about 29-30 kD as measured by SDS-PAGE and an amino acid sequence of any of SEQ. ID. NO: 1 through SEQ. ID. NO:6, wherein the composition induces expansion of inert plant cell wall material.
2. A composition according to claim 1, wherein the acidic medium has a pH of about 5.5 to 3.5.
3. A composition according to claim 1, further comprising a sulfhydryl reducing agent.
4. A composition according to claim 1, wherein the acidic medium comprises a member selected from the group consisting of sodium acetate and urea.
5. A composition according to claim 1, wherein the expansion is irreversible.
6. A composition according to claim 1, wherein the polypeptide is produced synthetically.
7. A composition according to claim 1, wherein the polypeptide is of plant origin.
8. A composition according to claim 7, wherein the polypeptide is derived from

a plant family selected from the group consisting of cucumber, oat, broccoli, celery, tomato, cotton, flax, cabbage and corn.

9. A composition according to claim 1, wherein the polypeptide is derived from cell wall material of a plant growing region.

10. A composition according to claim 9, wherein the plant is from the group consisting of cucumber, oat, broccoli, celery, tomato, cotton, flax, cabbage and corn.

11. A polypeptide comprising an amino acid sequence of any of SEQ ID. NO:1 through SEQ. ID. NO:6 and which induces an extension of plant cell wall material.

12. A polypeptide according to claim 11 having a molecular weight of from 25-30 kD as determined by SDS-PAGE.

13. A polypeptide according to claim 11 that is derived from cell wall material of a plant growing region.

14. A polypeptide according to claim 11 which induces the extension of plant cell wall material in the presence of an acid.

15. A polypeptide according to claim 14 wherein the acid has a pH of about 5.5 to 3.5.

16. A polypeptide having at least 60% sequence similarity to an amino acid sequence selected from the group consisting of SEQ. ID. NO: 1 through SEQ. ID. NO: 6 and which induces an extension of plant cell wall material.

17. A polypeptide according to claim 16 having a molecular weight of from 25-30 kD as determined by SDS-PAGE.

18. A polypeptide according to claim 16 having at least 70% sequence similarity to the amino acid sequence of SEQ ID. NO: 1.

19. A polypeptide of claim 16, wherein the amino acid sequence is SEQ. ID. NO: 1.

20. A polypeptide according to claim 19 having a molecular weight of from 25-30 kD as determined by SDS-PAGE.

21. A method of weakening [the] mechanical strength of cellulose comprising contacting a quantity of cellulose with a composition having at least one polypeptide comprising an amino acid sequence of any of SEQ. ID. NO: 1 through SEQ. ID. NO: 6.

22. A method according to claim 21, wherein the composition further comprises at least one of a sulfhydryl reducing agent and an acid.

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☐ 1. Document ID: US 6682738 B1

L3: Entry 1 of 3

File: USPT

Jan 27, 2004

US-PAT-NO: 6682738

DOCUMENT-IDENTIFIER: US 6682738 B1

TITLE: .beta.-expansins as cell wall loosening agents, compositions thereof and methods of use

DATE-ISSUED: January 27, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cosgrove; Daniel J.	Pennsylvania Furnace	PA		

US-CL-CURRENT: [424/185.1](#); [530/379](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 2. Document ID: US 6326470 B1

L3: Entry 2 of 3

File: USPT

Dec 4, 2001

US-PAT-NO: 6326470

DOCUMENT-IDENTIFIER: US 6326470 B1

TITLE: Enhancement of accessibility of cellulose by expansins

DATE-ISSUED: December 4, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cosgrove; Daniel J.	Pennsylvania Furnace	PA		

US-CL-CURRENT: [530/370](#); [435/183](#), [435/195](#), [435/209](#), [530/372](#), [530/375](#), [530/376](#), [530/377](#), [530/378](#), [530/379](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 3. Document ID: US [5959082](#) A

L3: Entry 3 of 3

File: USPT

Sep 28, 1999

US-PAT-NO: 5959082

DOCUMENT-IDENTIFIER: US 5959082 A

TITLE: Proteins catalyzing the extension of plant cell walls

DATE-ISSUED: September 28, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cosgrove; Daniel J.	State College	PA		
McQueen-Mason; Simon	York			GB
Guiltinan; Mark	State College	PA		
Shcherban; Tatyana	State College	PA		
Shi; Jun	State College	PA		

US-CL-CURRENT: 530/370; 530/324, 530/372, 530/375, 530/376, 530/377, 530/378, 530/379, 530/412, 530/417, 530/418, 530/419

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachment	Claims	KWIC	Draw. De
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